VOTALKER C-64 USER MANUAL

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CHAPTER 1

1.1 INTRODUCTION

1.2 INSTALLATION OF VOTALKER C-64

1.1 INTRODUCTION

The Voltalker C-64 speech synthesizer provides the Commodore-64 user with the ability to add spoken English prompts and responses to BASIC programs. It comes equipped with the Votrax SC-01-A speech chip and features a phoneme based text-to-speech algorithm that provides unlimited vocabulary at 95 percent accuracy. Votalker also provides "built-in" BASIC commands which make programming speech as easy as using a PRINT statement. Other features include automatic screen echo, upper case-lower case operation, three different translation modes, software controllable pitch and volume, pre-programmed function keys, a help command, and a built in speaker/amplifier.

Voltalker C-64 uses the phoneme method of speech construction. Phonemes are the basic sounds of speech, which when added together in the proper sequence, form intelligible spoken English or other languages. By utilizing this method, Voltalker C-64 can create an unlimited vocabulary of words, numbers and phrases which is restricted only by your imagination.

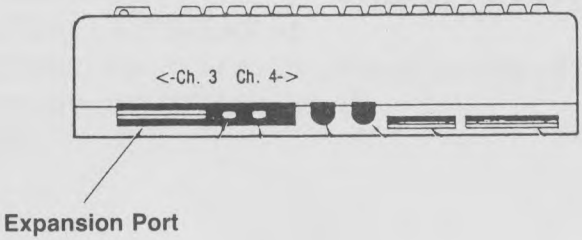
To make speech synthesis quick and easy, Voltalker C-64 adds thirteen new BASIC commands to the Commodre 64, the basis of which is the "SPEAK" statement. The SPEAK command functions similarly to a PRINT statement, the difference being that the command's expression is spoken instead of printed on the screen. The rest of Voltalker C-64's commands are used to control the screen echo, translation mode and other features. With the screen echo on, any text printed to the screen will automatically be spoken. Using these new commands, speech may be added to a program without the need to set up data fields, play games, such as the Votrax Trivia Talker II, run special software or perform other complicated procedures.

This user guide is designed as a tutorial and contains many examples of Voltalker C-64's features. The fastest way to learn these features is to sit down in front of your computer with your Voltalker C-64 in hand and follow through the rest of this chapter and chapter 2.

1.2 INSTALLATION OF VOTALKER C-64

To install Voltalker C-64, first TURN YOUR COMPUTER OFF and then plug Voltalker C-64 into the expansion port of the computer with the label facing upwards. (The expansion port is the slot on the far right when viewing the computer from the FRONT, SEE ILLUSTRATION.) Make sure that Voltalker C-64's gold fingered "tongue" gets inserted in the computer's connector and that the unit is firmly seated against the back of the computer. Now, simply turn your computer on and we're ready to start talking.

DIAGRAM



CHAPTER 2

2.1 GENERAL USE OF VOTALKER C-64

2.2 VOTALKER C-64"S 3 TRANSLATION MODES (MODE)

2.3 VOLUME AND PITCH CONTROL (VO,PI)

2.4 SCREEN ECHOING (ECHO,ECHOFF)

2.5 SPEECH CONTROL COMMAND (SPEECH,SPEECHOFF UPPERCASE, FKEYS,FKEYSOFF,HELP)

2.6 RATE ADJUSTMENT

2.1 GENERAL USE OF VOTALKER C-64 (SPEAK)

When you turn your computer on with Voltalker C-64 installed properly, the unit will respond with "VOTALKER READY". If this is not heard, you should check to make sure that the the unit is properly seated in the expansion slot. The first Voltalker C-64 command that we'll try is SPEAK. Enter the following line. (When we say to enter a line, it means to type in the line as shown and then press the RETURN key.)

SPEAK "HELLO, MY NAME IS VOTALKER C-64"

As shown by this example, Voltalker C-64 is accessed by the SPEAK command which vocalizes the command's expression. (The expression is the group of numbers, strings and phrases which follow the command) The SPEAK command may be used with a variety of expressions such as quoted strings, string variables, numeric expressions, numeric variables, string and numeric arrays, and just about any other expression which may be used with a PRINT statement. The only differences between the SPEAK and PRINT statements are that the ";" and "," separators and the TAB and SPC functions may not be used. These will result in a syntax error. To get an idea of some of the many ways that a SPEAK command may be used enter the following examples and hear what is said.

SPEAK "TESTING 1 2 3"

A$ = "TESTING 1 2 3":SPEAK A$

A$ = "TESTING ":B$ = "1 ":C$ = "2 ":SPEAK A$ + B$ + C$

A$ = "TESTING":SPEAK LEFT$(A$,4)

SPEAK 200

X=200:SPEAK X

X=100:SPEAK 2*X

X=50:Y=4:SPEAK X*Y

SPEAK SIN(3.1415*45/180)

It is important you realize that not all words that are given to Voltalker C-64 will be pronounced correctly. This is due to the method which converts text into spoken English. Voltalker C-64's software looks at the spelling of the word and uses a set of predefined rules to decide how the word should be pronounced. The closer a word is spoken to how it is spelled, the better Voltalker C-64 will pronounce it. For example, the word SIT would be pronounced very well whereas the word PIZZA would not.

If a word is not pronounced correctly, you should spell the word differently so that the spelling better matches the desired pronunciation. For example, the word PIZZA could be spelled PEETZA to improve its sound. On typical English text, Voltalker C-64 will be approximately 95% accurate in its conversion of text to speech.

IMPORTANT NOTE: If the new Votalker C-64 commands are to be used inside an IF statement, within a program, a colon must be placed between THEN and the command itself as shown below.

WRONG:

10 IF X=0 THEN SPEAK "ZERO"

RIGHT:

10 IF X=0 THEN: SPEAK "ZERO"

When using the IF statement with standard BASIC commands, this colon is not needed.

2.2 VOTALKER C-64'S 3 TRANSLATION MODES (MODE)

There are three modes which Voltalker C-64 may be operated under, mode 1 through mode 3. These modes affect the way that Voltalker C-64 converts text to spoken English. The mode of operation is chosen using the MODE command. As with the SPEAK statement, the MODE command may be used with a variety of expressions including numbers and strings. The expression must be between 1 and 3 or a syntax error will occur.

When you first turn your computer on with Voltalker C-64 installed the unit defaults to mode 1 or the CONVERSATION mode. This mode is also selected when a RUN/STOP-RESTORE IS PERFORMED. This mode speaks the text as you would if you were reading it. Words, numbers, letters and some symbols are spoken and the appropriate pauses are inserted where there are puctuation marks. Also, in this mode, Voltalker C-64's pitch and volume may be controlled from within the SPEAK statement but we'll discuss this in the next section.

The next mode, mode 2 or the VERBATIM mode, is similar to mode 1 except that everything is pronounced. Words, numbers and letters are spoken as in mode 1, however, all symbols and punctuation marks are also pronounced. Instead of a period giving a pause in the speech as in mode 1, in mode 2 the word "period" would be spoken. When the name of a symbol is spoken, it is pronounced at a higher pitch. This way the symbol "." can be distinguished from the word "period".

Mode 3, the character mode, is the simplest of the three modes. In this mode, every character is spoken separately. The names of all symbols are pronounced and all words and numbers are spelled out. Let's try speaking a sample sentence using the different modes to see their effects.

First, make sure that Voltalker C-64 is in mode 1 by entering the following line.

MODE 1

Now try entering the next line.

SPEAK "HELLO, HOW ARE YOU TODAY?"

Did you notice a slight pause where the comma is? If there was a word after the question mark, you would have noticed a longer pause between the word "today" and the following word. Now let's try mode 2 by entering the following line.

MODE 2

Once again, enter . . .

SPEAK "HELLO, HOW ARE YOU TODAY?"

Again the words are spoken the same as in mode 1, however this time the words "comma" and "question mark" were pronounced. Did you notice that "comma" and "question mark" were pronounced at a higher pitch? Let's give mode 3 a try by entering . . .

MODE 3

And once again, enter . . .

SPEAK "HELLO, HOW ARE YOU TODAY?"

This time, Voltalker C-64 spelled the text for you! These examples show how Voltalker C-64's different translation modes can take a given sentence and speak it three different ways. To demonstrate another interesting capability of Voltalker C-64, we will try speaking the number "-1234.5678" using the three different modes by entering the following lines.

2.2

MODE 1: SPEAK "-1234.5678"

MODE 2: SPEAK "-1234.5678"

MODE 3: SPEAK "-1234.5678"

Notice that in the first two modes the number was spoken as you would read it. Voltalker C-64 will speak numbers up to 999,999,999 with any number of decimal places in this manner. As you probably expected, in mode 3 each digit of the number was spoken separately. The table below shows how the three modes affect what is spoken.

CHAR.	MODE1	MODES 2&3
(!)	‹LONG PAUSE›	EXCLAMATION POINT
(")	‹NO SOUND›	DOUBLE QUOTE
(£)	NUMBER	NUMBER
($)	DOLLARS	DOLLARS
(%)	PERCENT	PERCENT
(&)	AND	AND
(')	‹NO SOUND›	SINGLE QUOTE
(()	‹NO SOUND›	OPEN PARENTHESEES
())	‹NO SOUND›	CLOSE PARENTHESEES
(*)	STAR	STAR
(+)	PLUS	PLUS
(,)	‹SHORT PAUSE›	COMMA
(-)	‹NO SOUND› or NEGATIVE	HYPHEN or NEGATIVE
(.)	‹LONG PAUSE› or POINT	PERIOD or POINT
(/)	SLASH	SLASH
(:)	‹LONG PAUSE›	COLON
(;)	‹SHORT PAUSE›	SEMI-COLON
(‹)	LESS THAN	LESS THAN
(=)	EQUALS	EQUALS

(›)	GREATER THAN	GREATER THAN
(?)	‹LONG PAUSE›	QUESTION MARK
(©)	AT	AT
([)	‹NO SOUND›	OPEN BRACKETS
( )	‹NO SOUND›	POUND
(])	‹NO SOUND›	CLOSE BRACKETS
( )	‹NO SOUND›	ARROW

2.3 VOLUME AND PITCH CONTROL (VO,PI)

You may control Voltalker C-64's volume and pitch using the VO and PI commands. The volume may be set to one of nine different levels by using the VO command with a number from one to nine. The command expression may also be a numeric or string variable. To see how the volume control works, enter the lines shown below.

```
VO 1
SPEAK "THIS IS A TEST"
VO 5
SPEAK "THIS IS A TEST"
VO 9
SPEAK "THIS IS A TEST"
```

To see how volume control can be used to generate special effects, enter and run the following program.

```
10 FOR K=9 TO 1 STEP -1
20 VO K
30 SPEAK "HELLO"
40 NEXT K
50 VO 5
```

The pitch may be set to four different levels by using the PI command with a number from one to four. As with the volume command, the expression may also be a variable. Enter the following lines to see how the PI command affects Voltalker C-64's speech.

2.3

PI 1

SPEAK "THIS IS A TEST"

PI 4

SPEAK "THIS IS A TEST"

PI 1

When Voltalker C-64 is powered up the volume is initialized to level 5 and the pitch to level 1. The volume and pitch are also reset to these values when a RUN/STOP-RESTORE is performed.

When Voltalker C-64 is being used in mode 1, the conversation mode, you can change the pitch and volume of its voice from within the SPEAK statement! To set the pitch, the letters PI and a number from 1 to 4 are placed in the SPEAK statement where the pitch is to be changed (Just like the pitch command). The PI and number must be contained within slashes such as /PI1/, /PI4/, etc. Also, for Voltalker C-64 to recognize this as a pitch change, there must be no spaces within this symbol. When Voltalker C-64 encounters one of these symbols in a sentence, the pitch is changed to that level until another pitch symbol is encountered or a pitch command is performed. Enter the following example sentences using pitch
control.

SPEAK "/PI1/ 1 /PI2/ 2 /PI3/ 3 /PI4/ 4"

SPEAK "/PI1/ DO /PI2/ YOU KNOW THE ANSWER"

There may be times when the user wishes to change pitch within the middle of a word. This may be done, however the pronunciation of some words may change when a pitch symbol is inserted in them. This happens because the word now appears as two separate words to the pronunciation rules. To get around this effect, the spelling of the word may be altered slightly as shown below.

SPEAK "/PI1/ ARE YOU IN TROU/PI2/BLE"

SPEAK "/PI1/ ARE YOU IN TRUH/PI2/BUL"

To change the volume within a SPEAK statement, the letters VO and a number from 1 to 9 are placed in the SPEAK command where the volume is to be changed. The VO and number must also be contained within slashes such as /VO1/, /V9/, etc. For Voltalker C-64 to recognize this as a volume change, there must be no spaces within this symbol. When Voltalker C-64 encounters one of these symbols in a sentence, the volume is changed to that level until another volume symbol is encountered or a volume command is performed. Enter the following lines using volume control.

SPEAK "/VO1/ 1 /VO3/ 2 /VO5/ 3 /VO7/ 4 /VO9/ 5"

SPEAK "/VO4/ I DON"T THINK /VO7/I/VO4/ SHOULD GO"

As with pitch control, a volume symbol may be placed within the middle of a word. Again, the word's spelling may have to be altered to keep the pronunciation correct. You should note that pitch and volume symbols may be used together within a SPEAK statement to create more natural sounding speech. The SPEAK statement shown below is similar to one of the pitch control examples from above but also adds volume control.

SPEAK "/PI1//VO3/DO /PI2//VO7/YOU /VO5/KNOW THE ANSWER?"

2.4 SCREEN ECHOING (ECHO, ECHOOFF)

The SPEAK command is not the only way to get your Voltalker C-64 to talk. The screen echo feature allows everything that is printed to the screen to be spoken. To turn the screen echo on, the ECHO command is used and to turn it off, the ECHOOFF command is performed. The echo feature works for anything printed from BASIC with a PRINT or INPUT statement, and all prompts and messages displayed by the computer, such as "READY" which appears with the cursor. Enter the following examples to see how the screen echo mode operates.

```
ECHO
PRINT "HELLO, HOW ARE YOU."
MODE 3
MODE 1
ECHOOFF
```

Notice that when mode 3, the character mode, was entered the "READY" prompt was spelled out for you! These modes can be used to vocalize programs which were not originally written to contain speech such as adventure games, and telecommunication packages. Even PRINT command graphics will not bother Voltalker C-64 since these characters are simply ignored. These modes may also be used to help the visually impaired write programs on the computer since program listings and disk directories will automatically be spoken. Also note that when the screen echo is on the SPEAK statement may still be utilized.

2.5 SPEECH CONTROL COMMANDS (SPEECH, SPEECHOFF, UPPERCASE, LOWERCASE, FKEYS, FKEYSOFF, HELP)

The SPEAK command can be disabled by using the SPEECHOFF command. This means that any SPEAK statements in a program will be skipped over or simply not performed. This is helpful when testing and debugging long programs when errors exist in statements other than SPEAK commands. The program will run much faster since it will not be waiting for text to be spoken. This mode is also useful when it is desired to toggle the speech portion of the program on and off.

To turn the speech back on after it has been disabled, a SPEECH command must be executed. Speech will also be turned on whenever a RUN/STOP-RESTORE IS PERFORMED. The sample program below first asks if a spoken output is desired, then inputs two numbers and calculates their sum.

```
10 INPUT "DO YOU WANT A SPOKEN RESPONSE? (Y/N)";A$
20 IF A$ = "Y" THEN: SPEECH
30 IF A$ = "N" THEN: SPEECHOFF
40 SPEAK "ENTER FIRST NUMBER"
50 INPUT "ENTER FIRST NUMBER";X
60 SPEAK "ENTER SECOND NUMBER"
70 INPUT "ENTER SECOND NUMBER";Y
80 SPEAK "THE SUM EQUALS":SPEAK X + Y
90 PRINT "THE SUM EQUALS " X + Y
```

Another Voltalker C-64 feature is the ability to speak in either the upper case/graphics mode or the upper case/lower case mode (the lower case mode of the computer is entered by SHIFT-COMMODORE KEY). Voltalker C-64 powers up in the upper case/graphics mode and is also reset to this when a RUN/STOP-RESTORE is performed. If you wish to use the lower case mode, a LOWERCASE command should be performed.

2.5

Voltalker C-64 allows you to access its four major features without having to enter any commands! Turning the speech on and off, the echo on and off, choosing upper case or lower case, and setting the translation mode may all be accomplished via the function keys! The table below lists the function key assignments.

F1	TOGGLES SPEECH ON AND OFF
F3	TOGGLES ECHO ON AND OFF
F5	TOGGLES UPPER CASE-LOWER CASE
F7	CHANGES THE TRANSLATION MODE

When the function keys are pressed, you will notice that Voltalker C-64 tells you which parameter has changed.

There are times when you may not want the function keys operative, for example, if you are running a program that uses the function keys for something else. To disable Voltalker C-64's use of the function keys, use the FKEYSOFF command. The function keys are now free to be used for other purposes. To turn the function keys back on, use the FKEYS command or perform a RUN/STOP-RESTORE.

The last command created by Voltalker C-64 is the HELP command. When executed, a list of Voltalker C-64's command are printed on the screen as a quick reference. This feature can be very helpful when writing programs utilizing Voltalker C-64.

2.6 RATE CONTROL

The Votalker C-64 comes with an external rate control that allows the user to adjust the speed of speech. The rate knob is found on the right side of the unit and is manually set.

CHAPTER 3

3.1 PROGRAMMING PHONEMES

3.2 PHONEME TABLE

3.1 PROGRAMMING PHONEMES

As discused in the introduction, Voltalker C-64 utilizes phonemes, the basic sounds from which speech is constructed, to create the words that the user hears when the SPEAK command is executed. The combination of phonemes that Voltalker C-64 assigns to a given word is determined by the text to speech algorithms in Voltalker C-64's software.

There may be times, however, when the user wishes to access these phonemes directly without using the SPEAK statement. By speaking separate phonemes in the correct order, speech and sound effects may be created.

The subroutine below may be used to speak a string of phonemes that are picked by the programmer and inserted in their proper order in the string variable array, PH(K). Note that the variable X in the FOR statement should be equal to the length of the phoneme string.

```
1000 POKE 57089,48
1010 POKE 57088,255
1020 POKE 57089,52
1030 FOR K=1 TO X
1040 POKE57088,PH(K)
1050 POKE 57089,62:POKE57089,54
1060 IF (PEEK(57089)AND128)=0 THEN 1060
1070 NEXT K
1080 RETURN
```

Lines 1000 through 1020 initialize Voltalker C-64. Line 1040 writes the phoneme to Voltalker C-64 and line 1050 latches the phoneme in. Line 1060 waits for Voltalker C-64 to say that it is finished speaking the phoneme and then continues on. The sample program shown below shows how to use the above subroutine to speak the word "HELLO".

```
10 DIM PH(8)
20 DATA 27,2,35,24,35,53,55,63
```

```
30 FOR K=1 TO 8
40 READ PH(K)
50 NEXT K
60 X=8:GOSUB1000
70 STOP
```

Lines 10 through 50 fill the array with the phoneme data. Line 60 sets the X variable of the subroutine to the number of phonemes and then calls the subroutine. The user should note that any method may be used to fill the array with the phoneme data and that this program is only one example.

3.2 PHONEME TABLE

The phonemes that are available to the user are shown below as the number which represents the phoneme, the phoneme symbol, the duration of the phoneme and an example word which contains that sound. This information was obtained from the VOTRAX SC-01-A Speech Synthesizer Data Sheet.

NUMBER	SYMBOL	DURATION	EXAMPLE WORD
00	EH3	59 (ms)	jack(E)t
01	EH2	71	(E)nlist
02	EH1	121	h(EA)vy
03	PA0	47	NO SOUND
04	DT	47	bu(TT)er
05	A2	71	m(A)de
06	A1	103	m(A)de
07	ZH	90	a(Z)ure
08	AH2	71	h(O)nest
09	I3	55	inhib(I)t
10	I2	80	(I)nhibit
11	I1	121	inh(I)bit
12	M	103	(M)at
13	N	80	su(N)
14	B	71	(B)ag
15	V	71	(V)an

3.2

16a	CH *	71	(CH)ip
17	SH	121	(SH)op
18	Z	71	(Z)oo
19	AW1	146	l(AW)ful
20	NG	121	thi(NG)
21	AH1	146	f(A)ther
22	OO1	103	l(OO)king
23	OO	185	b(OO)k
24	L	103	(L)and
25	K	80	tri(CK)
26	J **	47	ju(DG)e
27	H	71	(H)ello
28	G	71	(G)et
29	F	103	(F)ast
30	D	55	pai(D)
31	S	90	pa(SS)
32	A	185	d(AY)
33	AY	65	d(AY)
34	Y1	80	(Y)ard
35	UH3	47	miss(IO)n
36	AH	250	m(O)p
37	P	103	(P)ast
38	O	185	c(O)ld
39	I	185	p(I)n
40	U	185	m(O)ve
41	Y	103	an(Y)
42	T	71	(T)ap
43	R	90	(R)ed
44	E	185	m(EE)t
45	W	80	(W)in
46	AE	185	b(A)d
47	AE1	103	(A)fter
48	AW2	90	s(A)lty
49	UH2	71	(A)bout
50	UH1	103	(U)ncle
51	UH	185	c(U)p
52	O2	80	f(O)r
53	O1	121	ab(OA)rd
54	IU	59	y(OU)
55	U1	90	y(OU)

56	THV	80	(TH)e
57	TH	71	(TH)in
58	ER	146	b(IR)d
59	EH	185	g(E)t
60	E1	121	b(E)
61	AW	250	c(A)ll
62	PA1	185	NO SOUND
63	STOP	47	NO SOUND

*/T/ SHOULD PRECEED /CH/ TO PRODUCE CH SOUND.
** /D/ SHOULD PRECEED /J/ TO PRODUCE J SOUND.